Issue II, Volume iii July 2005

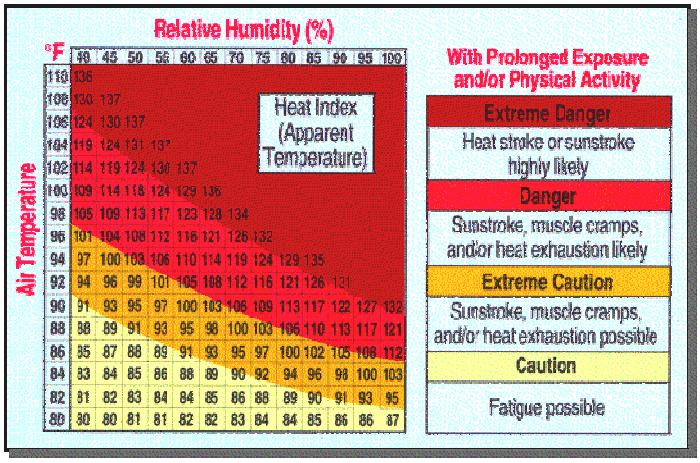
The High Plains Drifter

NATIONAL WEATHER SERVICE
NORTH PLATTE, NE

Heat Wave
A Major Summer Killer

Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died.

Based on the latest research findings, the NWS has devised the "Heat Index" (HI). The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature.



To find the HI, look at the Heat Index Chart. As an example, if the air temperature is 95°F (found on the left side of the table) and the RH is 55% (found at the top of the table), the HI-or how hot it really feels-is 110°F. This is at the intersection of the 95° row and the 55% column.

IMPORTANT: Since HI values were devised for shady, light wind conditions, **EXPOSURE TO FULL SUNSHINE CAN INCREASE HI VALUES BY UP TO 15°F. Also, STRONG WINDS, PARTICULARLY WITH VERY HOT, DRY AIR, CAN BE EXTREMELY HAZARDOUS.**

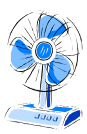
How Heat Affects the Body Human

Human bodies dissipate heat by varying the rate and depth of blood circulation, by losing water through the skin and sweat glands, and by panting, when blood is heated above 98.6 degrees. The heart begins to pump more blood, blood vessels dilate to accommodate the increased flow, and the bundles of tiny capillaries threading through the upper layers of skin are put into operation. The body's blood is circulated closer to the skin's surface, and excess heat drains off into the cooler atmosphere. At the same time, water diffuses through the skin as perspiration. The skin handles about 90 percent of the body's heat dissipating function. Sweating, by itself, does nothing to cool the body, unless the water is removed by evaporation, and high relative humidity retards evaporation.

Heat Wave Safety Tips

- **Slow down.** Strenuous activities should be reduced, eliminated, or rescheduled to the coolest time of the day. Individuals at risk should stay in the coolest available place, not necessarily indoors.
- **Dress for summer.** Lightweight light-colored clothing reflects heat and sunlight, and helps your body maintain normal temperatures.

- **Put less fuel on your inner fires.** Foods (like proteins) that increase metabolic heat production also increase water loss.
- **Drink plenty of water or other non-alcohol fluids**. Your body needs water to keep cool. Drink plenty of fluids even if you don't feel thirsty. Persons who (1) have epilepsy or heart, kidney, or liver disease, (2) are on fluid restrictive diets or (3) have a problem with fluid retention should consult a physician before increasing their consumption of fluids.
- **Do not drink alcoholic beverages.**
- **Do not** take salt tablets unless specified by a physician.
- **Spend more time in air-conditioned places.** Air conditioning in homes and other buildings markedly reduces danger from the heat. If you cannot afford an air conditioner, spending some time each day (during hot weather) in an air conditioned environment affords some protection.



- **Don't get too much sun.** Sunburn makes the job of heat dissipation that much more difficult.

What's Inside

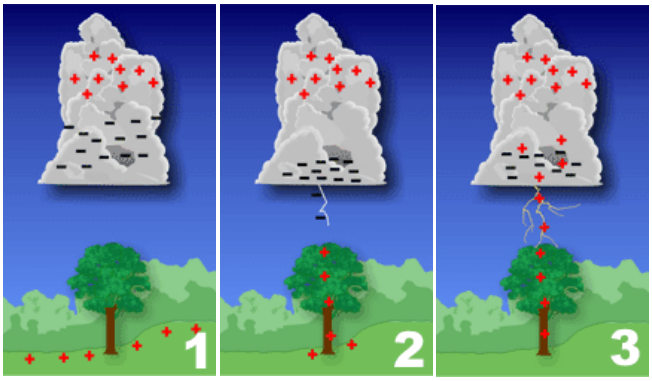
Comments and suggestions are always welcome. Your feedback is very important to us!

LIGHTNING SAFETY AWARENESS WEEK

June 19th through 25th, 2005

The National Weather Service is sponsoring Lightning Safety Awareness Week from June 19th-25th, 2005. The purpose of the week is to help people understand the hazards of lightning, and give them positive actions they can take to protect themselves during lightning storms. The tragic facts are: on average 73 Americans die from lightning each year, hundreds are injured, and most lightning accidents can be avoided with a few simple steps.

How does lightning develop?



Lightning is a large electric spark. Collisions of hail and ice in the thunderstorm cause a large pool of negative electric charges to develop in the lower part of the thunderstorm, and positive charges with smaller ice crystals high up in the storm. Along the ground under the thunderstorm, positive charges pool. As the electric charges build up, negative step leaders reach towards the ground, and connect with dart leaders reaching skyward from ground based objects such as trees, buildings, or telephone poles. When these two meet, lightning develops. If you are near a thunderstorm and your hair rises, you are in the area where positive ions are reaching skyward, and your personal threat is very high. That is the time to seek shelter quickly

What are the safest places during lightning?

Protect yourself and your family during a lightning storm by seeking shelter in a sturdy building. In the house stay away from open windows, computers or electrical appliances, get off the telephone and stay out of the shower. If no building is nearby, get in a metal roofed car, close the windows, and stay away from metal. Do not seek shelter from lightning in an open carport or shed because you may stay dry but they are not properly grounded. If no shelter is available, make minimum contact with the ground by getting onto the balls of your feet and squatting down to form a small ball.

Count the number of seconds from when you see lightning to when you hear thunder.

Divide this number by 5 to get the number of miles away that the lightning bolt struck.

What is the 30/30 rule?

As you strive to remain safe from lightning dangers, consider the 30/30 rule. If the thunder is heard within 30 seconds or less of the lightning, the 30/30 rule says it is time to start seeking shelter. The second half of the 30/30 rule says wait for 30 minutes until after you hear the last clap of thunder before resuming outdoor activities. Adopting a consistent approach to lightning response such as the 30/30 rule will greatly minimize the lightning risk to your group, team, or family.

For more information on lightning safety tips, medical facts, survivor stories, and more, go to **www.lightningsafety.noaa.gov**.

The National Weather Service in North Platte is looking for photos or videos of severe weather.

We are always looking for photo documentation of severe weather in our area to create a photo history of severe weather. We use the pictures of severe weather during our storm spotter talks and during school visits. We may even frame a photo to hang in our office. The photos can be from very long ago or tomorrow. If you, or anyone you know, have any photos or video of severe weather and would be willing to share these with us, please contact either Deb Blondin, Christina Hannon, or John Stoppkotte. We will promptly return your media after we produce a copy with your permission. We can be reached at 1-800-603-3526.

Cooperative Weather Observer Awards

Curtis 3NNE, Lorinda Elson and Jim Sweet

On Tuesday, April 26, 2005 **Lorinda Elson** of **Curtis** was honored by the National Weather Service for her 20 years of service as a cooperative observer, recording temperature and precipitation. The award was presented by Jim Sweet (HMT) and Mark Byrd (OPL) (not pictured). The station has been in Curtis since January 1, 1893.

Anselmo 2SE, Leonard and Ruth Lindly (Ruth is accepting for Bob)

On Thursday, May 5, 2005 **Leonard and Bob Lindly** of **Anselmo** were honored by the National Weather Service for their 10 years of service as cooperative weather observers, recording temperature and precipitation. The brothers were presented their awards by Mark Byrd (OPL). Precipitation was first recorded at Anselmo in 1940 and temperature observations began in 1962.

Rushville, Janet and Glen Mitchell

On Friday, June 10, 2005 **Glen Mitchell** of Rushville was honored by the National Weather Service for his 25 years of service as a cooperative weather observer, recording temperature and precipitation. The award was presented by Ron Burns (HMT). Observations have been recorded in Rushville since 1941.

Know These Heat Disorder Symptoms

SUNBURN: Redness and pain. In severe cases swelling of skin, blisters, fever, headaches. **First Aid:** Ointments for mild cases if blisters appear and do not break. If breaking occurs, apply dry sterile dressing. Serious, extensive cases should be seen by physician.

HEAT CRAMPS: Painful spasms usually in muscles of legs and abdomen possible. Heavy sweating. **First Aid:** Firm pressure on cramping muscles, or gentle massage to relieve spasm. Give sips of water. If nausea occurs, discontinue use.

HEAT EXHAUSTION: Heavy sweating, weakness, skin cold, pale and clammy. Pulse thready. Normal temperature possible. Fainting and vomiting. **First Aid:** Get victim out of sun. Lay down and loosen clothing. Apply cool, wet cloths. Fan or move victim to air conditioned room. Sips of water. If nausea occurs, discontinue use. If vomiting continues, seek immediate medical attention.

Heat Index / Heat Disorders

Heat Index	Possible heat disorders for people in higher risk groups
130º or HIGHER	Heatstroke/Sunstroke highly likely with continued exposure
106º -130º	Sunstoke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity.
90º -106º	Sunstroke, heat cramps or heat exhaustion possible with prolonged exposure and/or physical activity.
80º - 90º	Fatigue possible with prolonged exposure and/or physical activity.

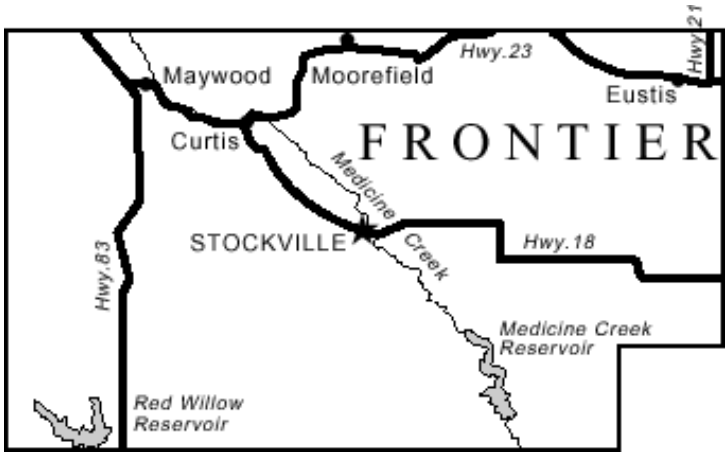
HEAT STROKE (or sunstroke): High body temperature (106°F. or higher). Hot d ry skin. Rapid and strong pulse. Possible unconsciousness. **First Aid: HEAT STROKE IS A SEVERE MEDICAL EMERGENCY. SUMMON EMERGENCY MEDICAL ASSISTANCE OR GET THE VICTIM TO A HOSPITAL IMMEDIATELY. DELAY CAN BE FATAL.** Move the victim to a cooler environment Reduce body temperature with cold bath or sponging. Use extreme caution. Remove clothing, use fans and air conditioners. If temperature rises again, repeat process. Do not give fluids. Persons on salt restrictive diets should consult a physician before increasing their salt intake.

STOCKVILLE

By Christina Hannon – Meteorological Intern

Cooperative stations are placed in the "b" network if their observations are used primarily to support NWS hydrologic programs, such as flood forecasting, hydrologic planning and water supply. The observers are located in areas where the rainfall and snowfall can impact river stages downstream. Knowledge of the amount of precipitation helps forecasters determine the likelihood of flooding. Some observers report when they are receiving heavy rainfall or snow and are crucial aides in flash flood and heavy snow events. Their near-real time observations help in the decision processes when the forecasters issue warnings.

One such station that is in the “b” network is Stockville. Mrs. Doris Thompson began reporting as a cooperative weather observer at the Cambridge Dam when she read the river stage. She recently celebrated her 82nd birthday and when she isn’t able to check the rain gage in the morning due to muddy or icy conditions her son helps her out. After 30 years of reporting, she doesn’t feel like it has been that long. Besides keeping a eye on the weather, Doris enjoys collecting stamps and the outdoors.



Map of Frontier County

Stockville had its beginning as a trading center for the ranchers in the south central region. Organized in 1872 and laid out by W.L.McClary as the county seat of Frontier County, Stockville grew rapidly when homesteaders arrived. The Stockville cooperative observing station began in 1891 by J. M. Noyes. The town now has a population of about 36. The current cooperative observing site is located near Spring Creek surrounded by draws and canyons.

All Time Records (since 1947)	
Precipitation	4.40 inches on September 5, 1949
Snow	18 inches on December 27, 1982

Monthly and Yearly Averages (1971-2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip	0.45	0.55	1.32	2.14	3.42	3.50	3.08	2.75	1.44	4.33	0.94	0.31

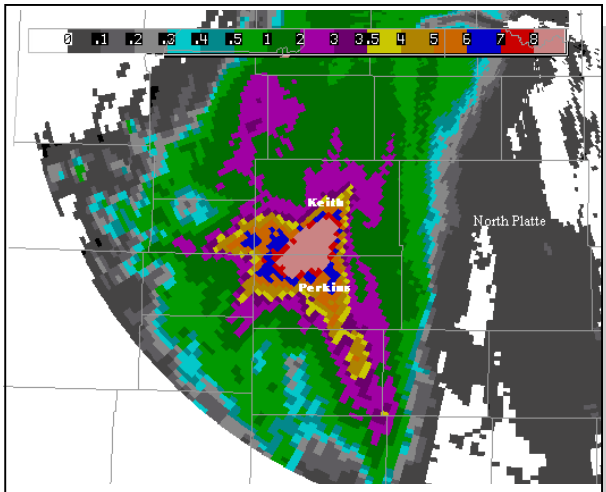
	Precip	Snow
30 Year Avg	21.22	24.9

Flash Floods

The previous newsletter had information about flood safety awareness week. Flooding, though rare, does occur in Western Nebraska. If you notice water over roadways, report the location to your local law enforcement and tell them to relay the information to the National Weather Service in North Platte. Do not attempt to cross the water covered roadways, instead Turn Around, Don't Drown.

Ogallala Flood Event of July 6th, 2002

During the late evening of July 5th showers and thunderstorms moved north out of eastern Colorado and western Kansas into southwest Nebraska. They continued to re-develop and move over the same locations in Keith and Perkins counties through much of the night and into the late morning of July 6th. By the time it was all said and done, some areas over south central Keith and north central Perkins counties had received over eleven inches of rain. This led to significant flash flooding across the area. This event stood out for several reasons, first of all, the magnitude of the rainfall was extraordinary for an area that does not typically see such an extreme amount of precipitation. Second, this flash flood event occurred during the middle of an extreme drought, which took many people by complete surprise.



Radar rainfall estimates (in inches) through late morning on July 6, 2002.

The flash flooding over Perkins and Keith counties will be remembered for some time to come. The extremely heavy rainfall and subsequent flash flooding destroyed portions of Interstate 80, as well as many state and county roads in the area. Portions of I-80 remained closed for nearly a week following the flooding as road crews scrambled to repair the damage. There was also one fatality as a motorist was ejected from a truck at the scene of a bridge collapse. Numerous dams overflowed at the height of the flooding. Damage estimates for this event was around $800,000. The National Weather Service issued flash flood warnings for Keith and Perkins counties nearly 2 hours before the serious flooding began, allowing emergency management officials enough time to issue evacuation orders, and in all likelihood save lives. The forecaster's ability to identify the situation and issue timely warnings likely prevented this disaster from being any worse than it already was.

Photos from Other Flood Events

Hayes County Flash Flood of August 28, 1999 along Little Blackwood Creek after 10-14 inches of rain.


Flooded South Platte River at North Platte, looking at golf course under water.


Stinking Water Creek, Northwest of Hamlet, 60 hours after heavy rain fell in Perkins County on June 9, 2005.

Tornadoes in Thunderstorms : Looking for Clues

By John Stoppkotte, Science and Operations Officer

For those of us who have lived in Nebraska for many years, we know that thunderstorms are an everyday item of life, and in some cases, our livelihood depends on them and the rainfall they can bring. But we also know that thunderstorms can often bring a more unpleasant element; severe weather. When all the right ingredients combine, thunderstorms can produce destructive winds, large, damaging hail, and, on occasion, tornadoes. We've learned a great deal about how these storms develop as a whole. We have also learned, although not with complete certainty, which storms have the better chance to produce severe weather. But, what have we learned about the science of how tornadoes develop, or, as we in the weather community call it, "tornadogenesis"? What tools are available to help look for clues?

Based on climate research done by the National Weather Service (NWS) and the High Plains Regional Climate Center at UNL, we know that the months of May, June and July account for over three-quarters of all tornadoes reported in a given year in Nebraska. The reason: the ingredients that develop thunderstorms that can produce tornadoes come together most frequently in those months. What are those conditions? First we need a thunderstorm to develop, and to do that, and to form precipitation of any kind, we need: 1) moisture, 2) a way to lift the air and 3) some amount of unstable air. For severe thunderstorms we then need wind shear, or a measure of how the wind changes with height, to be present in addition to the other 3 ingredients. This will provide us with the necessary items to produce supercell thunderstorms, from which most severe weather is reported. Research done in the mid 1990s indicated that a large number of tornadoes were also reported with supercell thunderstorms, and researchers began to find clues as to how this occurs. This news gave those of us in the NWS hope for being able to differentiate a storm that might produce a tornado from one that, most likely, wouldn't. However, this same research, and other research that has followed, has also shown us that tornadoes can form in other situations too. Situations that are, unfortunately, even harder to determine ahead of time than before! All is not lost though.

Technology has afforded those of us in the meteorologic community the ability to run computer models that can help us in determining how the atmosphere is changing over time. These models allow us to infer how much moisture is in the atmosphere, how much potential the air has of being lifted, and also how unstable the atmosphere is becoming. We also have the ability to look at instruments that can tell us whether wind shear is becoming favorable for producing supercell thunderstorms. However, we're now learning that much of what determines whether a tornado will be produced or not happens in the lowest 3,000 feet near the ground. That is where storm spotters can help greatly! Their description of storm characteristics can sometimes be the final piece of the puzzle that helps the forecasters in the NWS decide to issue a tornado warning, as opposed to a severe thunderstorm warning.

The latest tornado research by those of us here in the NWS, and others, suggest that tornadoes can develop very quickly in thunderstorms that are not yet fully developed. These types of tornadoes are given the name "landspout" because their development is similar to the development of waterspouts, only landspouts develop entirely over land. Because these occur with thunderstorms not yet in the mature stage, we often here about tornadoes that "come out of the blue", because the cloud associated with it doesn't seem as ominous. From a radar perspective these events can be difficult to assess. However, thanks to computer models that help us determine when these events are more likely, and spotters who can tell us cloud characteristics, we at the NWS are starting to get a better handle on landspout development. It is critical, however, that we learn more about tornadoes and other kinds of severe weather. When severe weather, especially tornadoes, happen, we have the ability to save all of the data so we can "replay" the event to research it, much like a detective would research a crime scene. We look at each aspect of the event to look for clues that will help us in similar situations. This will ultimately help us in our quest to really understand how tornadoes can develop and how we may plan to anticipate their development.

Climatological Calender

Climatological Data for March, April, May 2005

prepared by Christina Hannon, Meteorological Intern

Location	Month	Average	Departure	Rain	Departure	Highest	Lowest
North Platte	March	38.6 ºF	+0.6º F	1.77 inches	+0.53 inches	74º F (28th)	7º F (1st)
	April	47.7 º F	-0.4 º F	2.33 inches	+0.36 inches	80º F (7th)	20º F (1st)
	May	57.0 º F	-1.3 º F	3.04 inches	-0.30 inches	92º F (20th)	18º F (2nd)
Valentine	March	36.8 º F	+1.5 º F	1.29 inches	+0.18 inches	74º F (28th)	7º F (1st)
	April	48.4 º F	+2.3 º F	4.57 inches	+2.60 inches	83º F (17th)	19º F (1st)
	May	55.8 º F	-1.7 º F	2.63 inches	-0.57 inches	90º F (20th)	18º F (3rd)

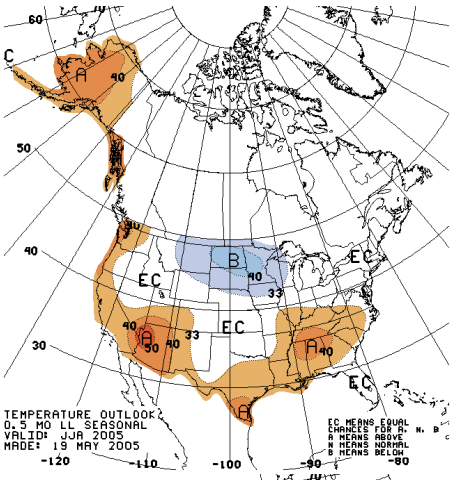
Normal High/Low Temperatures

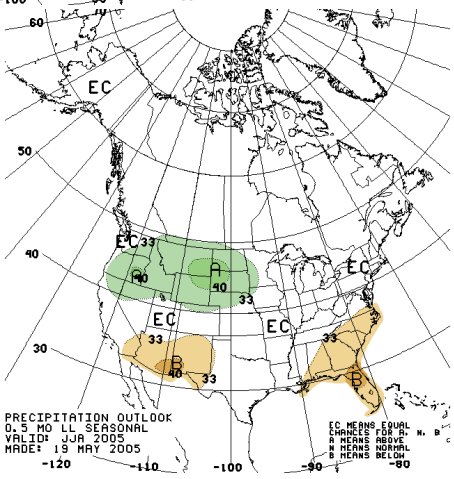
Location	July 1	Aug 1	Sept 1	Oct 1
North Platte	87/58	89/61	83/53	73/40
Valentine	86/57	89/60	83/52	71/39

June-July-August Outlook

Best chances for temperatures to be below normal extend from eastern Wisconsin to Montana and from the Canadian border south to northern Nebraska and Iowa. Above normal temperatures are more likely across southeast Missouri through Kentucky.

For precipitation, chances for above normal amounts extend across a broad swath from western Minnesota through the Dakotas and northern and western Nebraska and further west to encompass all of Wyoming and a bit of northern Colorado. The highest percentages are located over northwest South Dakota





Temperature (above) and Precipitation (right) outlooks for the summer season of 2005.

CLIMATE OUTLOOK KEY

The key below is used to interpret each of the color versions of the ***Climate Outlook*** products. In areas where confidence in predictive skill has been established, the probabilities of the normal, near normal or below normal categories are increased accordingly above the Climatology level of 1/3 (33.3%) for each category. These probabilities are contoured using colors as depicted in the key below.

In those area where the skill of our present prediction tools is not sufficient, the default is equal chances (white color). The probabilities of experiencing each of the three categories (above normal, near normal or below normal) remain equally likely (1/3) n the white areas on the maps to the left. The outlined percentages below correspond to the values on the map.

Precip	Temp	Probability of Occurence: Above	Near	Below	Most likely category
		80.0%-90.0%	16.7%-06.7%	03.3%	"Above"
		70.0%-80.0%	26.7%-16.7%	03.3%	"Above"
		60.0%-70.0%	33.3%-26.7%	06.7%-03.3%	"Above"
		50.0%-60.0%	33.3%	16.7%-06.7%	"Above"
		40.0%-50.0%	33.3%	26.7%-16.7%	"Above"
		33.3%-40.0%	33.3%	33.3%-26.7%	"Above"
		33.3%-30.0%	33.3%-40.0%	33.3%-30.0%	"Near Normal"
		30.0%-25.0%	40.0%-50.0%	30.0%-25.0%	"Near Normal"
		33.3%-26.7%	33.3%	33.3%-40.0%	"Below"
		26.7%-16.7%	33.3%	40.0%-50.0%	"Below"
		16.7%-06.7%	33.3%	50.0%-60.0%	"Below"
		06.7%-03.3%	33.3%-26.7%	60.0%-70.0%	"Below"
		03.3%	26.7%-16.7%	70.0%-80.0%	"Below"
		03.3%	16.7%-06.7%	80.0%-90.0%	"Below"
		33.3%	33.3%	33.3%	"Equal Chances"

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Kenny Roberg Mitch Power
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Dennis Phillips Jim Connolly

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